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ABSTRACT

This study contributes to the research on the Application of Cognitive Functions Scale (ACFS) (C. Lidz and R. Jepsen, 2001), a new dynamic assessment approach for young children. Dynamic assessment is an assessment tool that follows a test-intervention-retest model, using the teaching as part of the assessment. The ACFS assesses the child's ability to apply cognitive functions to tasks that represent the learning processes necessary for school achievement. This study investigated the effects of mediation on the Pattern Sequencing subtest and the Visual Memory subtest of the ACFS. Participants were 30 preschool children aged 3 to 5 years. All were of Jewish backgrounds, and more than half came from families in which at least one parent had a Master's degree. Children were divided into control and experimental groups, with those in the experimental group receiving the intervention portion of the dynamic assessment. Results document the lack of practice effects for these participants. There were virtually no significant gains from pretest to posttest for the children not receiving mediation. The only group demonstrating a significant gain was the mediated group in its performance on the Pattern Completion subtest. The lack of significant gains on the Visual Memory subtest may be related to the fact that the study used children with typical development. Pretest scores were high, and posttest scores were close to the ceiling for the measure. Study results do suggest that the ACFS is a tool a school psychologist could use to make accurate assessments and productive educational plans. (Contains 30 references and 4 tables.) (SLD)

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INVESTIGATION OF THE EFFECTIVENESS OF THE MEDIATION PORTION OF TWO SUBTESTS OF THE APPLICATION OF COGNITIVE FUNCTIONS SCALE, A DYNAMIC ASSESSMENT PROCEDURE FOR YOUNG CHILDREN

By:

Miriam Malowitzky

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Thesis

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Miriam Malowitzky

Thesis under the direction of Professor Dr. Carol Lidz

ABSTRACT

The purpose of this study is to contribute to the research on the Application of Cognitive Functions Scale (ACFS), a new dynamic assessment approach for young children. The ACFS assesses the child's ability to apply cognitive functions to tasks that represent the learning processes necessary for school achievement. First, this study explores the theory of dynamic assessment, reviews other dynamic assessment approaches and shows its application to the field of school psychology. Next, this study illustrates the need for more preschool dynamic assessment procedures and the need for this study to investigate aspects of validity of the ACFS procedure. Finally, the study found significant pre to post test gain for one of the mediated subtests, and no significant gains for the unmediated subtests. These findings suggest that practice alone does not account for pre to post test gains on these subtests.

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Introduction

Dynamic assessment is an assessment tool that follows a test-intervention-retest model (Lidz, 1991). This format is based on the belief that the child's process of learning can change in response to the intervention provided (Lidz, 1996). This theory is linked to Vygotzky's view of learning and development in which he emphasizes the role of the adult in the learning experience (Spector, 1992). Vygotzky called the area in which a child can participate in activities that are somewhat above his/her level of independent functioning, with the help of an expert, the zone of proximal development (ZPD) (Bain & Olswang, 1995). Whereas the zone of actual development describes the learner's independent level of performance, the ZPD describes what the child is able to do with the help of a more experienced collaborator (Lidz, 1996).

Because dynamic assessment uses the teaching as part of the assessment, it supplies useful information for developing intervention (Lidz, 1991). By looking at the learning process, the examiner discovers how the child learns and how the child can best be instructed (Lidz, 1997). In this way, the results of dynamic assessment are relevant to the learning experience in the classroom (Lidz,1991).

Dynamic assessment has been applied primarily to school age and older learners; however, it is a valuable tool when dealing with the preschool population as well. Many decisions are made in the preschool years that will impact the child's future learning. Therefore, it is crucial to use procedures that will help identify risk factors and efficient mediational strategies to overcome learning difficulties, as early as possible (Haywood & Tzuriel, 1992).

One preschool dynamic assessment procedure that is currently being developed is the Application of Cognitive Functions Scale (ACFS) (Lidz & Jepsen, 2001). The ACFS assesses the child's ability to apply cognitive functions to tasks that represent the learning processes necessary for school achievement.

The purpose of this study is to contribute to the evidence concerning reliability and construct validity of the ACFS. Specifically, this study investigated the effect of mediation on the Pattern Sequencing subtest and the Visual Memory subtest of the ACFS. The nature of dynamic assessment is to provide intervention and to assess the response of the child to the intervention. In order to conclude that any gains made by the child can be attributed to the intervention, practice effect needs to be ruled out. Therefore, this study will serve as a partial investigation of the reliability and validity of the ACFS. If the subtests are administered twice without intervention, this provides evidence regarding test-retest reliability. If the participants who experience intervention perform at a significantly higher level following the intervention, while those who receive no intervention fail to make gains, this provides evidence of construct validity.

Research Review

Overview of Dynamic Assessment:

As the educational system becomes more humanistic in nature, the kinds of assessment procedures used are changing as well. Traditional assessment methods were designed for classifying children for different educational programs. Traditionally, the school psychologist used IQ tests as the main tool for placing children in special education classes. However, as education becomes more focused on the individual and how learning experiences can be enhanced, there have been attempts to modify the testing procedures and to create new assessment procedures (Tzuriel & Haywood, 1992).

In response to the shift in educational goals, dynamic assessment has emerged as an assessment tool for the school psychologist (Tzuriel & Haywood, 1992). Unlike traditional testing which focuses on the child's current knowledge, dynamic assessment examines a child's learning

processes (Lidz, 1991). According to Lidz (1996), "Dynamic assessment begins where traditional psychometric assessment ends." (p. 282) Instead of ending the testing with the ceiling, dynamic assessment explores the ceiling to discover what the child can learn with the help of a more experienced collaborator. Whereas normed, standardized and curriculum-based approaches provide information regarding the "actual" or independent functioning of the learner, dynamic assessment explores the "proximal" or facilitated performance of the learner (Lidz, 1996). It provides information about "how" the learners learn and "how" learners are best instructed, rather than responding to questions of classification and program eligibility (Lidz, 1997). The dynamic approach focuses on the individual" capacity for change as a result of the learning process (Tzuriel & Klein, 1985). By looking at the learning process, the examiner discovers information about the learner that can lead to appropriate, individualized interventions. In essence, dynamic assessment allows the examiner to discover how to teach the child effectively (Lidz, 1991).

The dynamic assessment model is linked to Vygotzky's view of learning and development. In his work, Vygotzky emphasizes the role of the adult in the learning experience. The adult acts as the expert, demonstrating how to solve a problem or do a specific task. After a while, the child can perform the activity more independently and the adult only provides help when needed. Eventually the child learns internalizes the skills and is able to perform the activity independently (Spector, 1992). Through this interaction, the mediator develops and explores the child's ZPD. According to Vygotzky, facilitation of the independent functioning of the learner is only one part of the assessment. In order to arrive at a more complete prognosis of the learner, both the actual and the proximal zones need to be understood (Lidz, 1996).

While dynamic assessment models have varied, there tends to be some general characteristics. First, it is administered according to a test-intervention-retest format (Lidz, 1991). The examiner administers a static test to establish a baseline. This score estimates the student's

level of independent performance. Then, there is a teaching segment where intervention is supplied in the form of strategies, problem solving techniques and rules. Meanwhile, the examiner is recording the kinds and amount of teaching that was supplied to the child. Last, a posttest is given to determine how much learning and generalization of the intervention occurred (Haywood, Tzuriel & Vaught, 1992). The test-intervention-retest format allows the tester to learn what works and what does not work in bringing the child to success. It also explores the intensity of the intervention needed to promote change within the learner. This characteristic of the dynamic assessment approach creates and explores the ZPD, giving the tester insight into the learning potential of the child (Lidz, 1997).

The test-intervention-retest aspect of dynamic assessment is closely related to learner modifiability, the second definitive characteristic of a dynamic assessment model. "Modifiability" involves assessing how much change was made by the learner in response to the interventions provided and if the child applied what was learned to other instances of problem solving (Lidz, 1991). This aspect relies on the interaction between the tester and the student as part of the assessment. When a child has difficulty answering a question or solving a problem, the assessor tries to bring him to a level of success by modifying the format, giving other examples, or providing more direct cues and prompts. I this way, this second criteria allows the tester to evaluate how responsive the learner is to intruction (Spector, 1992).

The third defining characteristic of dynamic assessment is that it generates information for developing interventions. Because dynamic assessment uses the teaching as part of the assessment procedure, the tester must analyze the learner's needs in order to determine successful interventions. The assessor also must carefully record what interventions seem to work, so that they can be implemented in the classroom.

Throughout this process, the tester learns what works and what does not work for the learner. It also gives information about the intensity of the intervention needed. In addition, the tester learns which of the child's processes are functional and which need to be taught or improved. In this way, the results of the assessment are relevant to the learning experience in the classroom (Lidz, 1991).

Dynamic Assessment Procedures:

Reuven Feuerstein, a pioneer in the field of dynamic assessment developed a tool called the Learning Potential Assessment Device (LPAD). He applied Vygotzky's theory of Dynamic Assessment in working with disadvantaged adolescent emigrants to Israel during the 1950s and 1960s (Frisby & Braden, 1992). Feuerstein's approach incorporated the belief that many children who earn poor scores on conventional IQ tests do so because of a significant lack of mediated learning experiences. He believes that a lack of mediated learning experiences is the greatest cause of retarded performance. Therefore, his LPAD is designed to measure the extent that an individual's cognitive structures can be changed in response to an adult is provision of mediated learning experience (Laughon, 1990). Because the LPAD focuses on modifiability, the activities are not based on academic tasks, and are designed to generate learning (Tzuriel & Haywood, 1992).

Another dynamic assessment approach is Budoff's Learning Potential Procedure. His work is based on the assumption that for some educable mentally handicapped

individuals, the verbally- based IQ score underestimates their potential for learning (Laughon, 1990). His test- teach- retest model focuses on helping students understand the demands of the tasks, providing praise and encouragement, and allowing students to experience success by checking the solution strategy. Budoff reasons that incorporating standardized training procedures into the assessment equalizes the differences in disadvantaged students' experience, thus enabling them to succeed (Jitendra & Kameenui, 1993).

Brown and Campione's approach is based on an information- processing theory of intelligence. They look at the amount of instruction needed to learn and to transfer information (Laughon, 1990). Their test uses a series of predetermined graduated prompts, sequenced from general and abstract to more explicit and concrete, depending on the individual's responses (Jitendra & Kameenui, 1993). This approach assumes that the greater the individual's ability, the fewer the prompts required to elicit the correct response and the more likely the child can transfer this learning to new situations (Campione & Brown, 1987).

Swanson's Cognitive Processing Test (S-CPT) is a dynamic assessment approach that examines the working memory. It follows a format in which hints are presented to the individual after failure of a particular item in each subtest. The S-CPT is an example of a graduated prompting procedure where the hints are predetermined and gradually approximate total problem solution by the assessor (Swanson, 1995).

Applications of Dynamic Assessment:

Dynamic assessment looks at how an individual learns and not just at what he/she knows. Therefore, dynamic assessment is a useful tool when assessing the culturally diverse learner. Because dynamic assessment provides information and skills needed for problem solving, the culturally diverse learner is not required to have previous knowledge of the task. Also, because dynamic assessment is interactive, the assessor works collaboratively with the child, taking the lead. In this way, the child is not threatened or confused by the possibly unfamiliar style of standardized testing (Lidz, 1997).

The nature of dynamic assessment is especially useful when dealing with the special education population. Traditional psychometric approaches highlight the learning disabled child's deviant learning patterns, whereas dynamic assessment will learn about the child's learning style and how the child can best learn in the classroom (Gerber, Semmel & Semmel, 1994). Similarly, because of the static nature of standardized assessments, the intellectual ability of the special needs child is often underestimated. A mediational style of teaching ensures individualized teaching that optimizes the performance and is more likely to tap the potential of the child (Missiuna & Samuels, 1989).

A third area of application of the dynamic assessment model is in the area of language assessment. When assessing a child's language ability, the challenge is to differentiate between language difference and language deficiency (Lidz, 1996). When assessing a child whose dominant language is not English, not only does the vocabulary

differ, but there also are differences in semantic, syntactic, phonology of the languages and style of communication. Therefore, even if the test is translated into the child's language, so much meaning is lost or distorted and the assessment may lose considerable accuracy.. In addition, there are often cultural differences within a language and a child who does not come from the American mainstream home may not have had the experiences reflected in the questions. As a result, the assessment is not an accurate description of the child's ability (Pena, Quinn & Iglesias, 1992). Dynamic assessment is a more appropriate way of assessing a child's language ability. Because dynamic assessment looks at the interaction between the child and tester and evaluates how much new material the child is internalizing, there is less reliance on prior knowledge and experience. Also, dynamic assessment focuses on the child's competence and discovery of what works as opposed to what the child is lacking. In addition, the interactional nature of dynamic assessment allows for diverse ways of responding and is not limited to one particular style (Lidz, 1997).

Measures of Dynamic Assessment for Young Children:

Dynamic assessment can be valuable when dealing with the preschool population. In the preschool years, many decisions about the child's future education are made. Because these early decisions will impact future learning, it is crucial to use the tools that will be accurate and relevant to the decisions being made. In addition, because dynamic assessment gives information about the specific learning style of a child, using these kinds of assessment allows one to develop mediational strategies even before the child

experiences learning difficulties (Haywood & Tzuriel, 1992). Using dynamic assessment with young children can help discover what the child can learn with good teaching (Mearig, 1987).

Most dynamic assessment measures have been designed for use with school age children and adults. Although the instruments have been used with younger individuals, they are not appropriate in their present form for most preschool age children (Mearig, 1987). Dynamic assessment approaches for preschool children need to look at the cognitive functions that are unique to that age and which influence the assessment. For example, young children show distractibility and have a natural instinct for play. In addition, they may not be able to express their thoughts clearly and sometimes show inconsistency in their performance (Haywood & Tzuriel, 1992). When developing dynamic procedures for the preschool population, these developmental issues must be considered.

A number of researchers have developed dynamic assessment approaches appropriate for assessment of young children. For example, the Bunny Bag was developed by Waters and Stringer (1997), as a response to answering some questions about the cognitive development of preschool children. Developed for children between the ages of 6 months and 4 years 5 months, the Bunny Bag assesses preschool children with complex communication needs. It consists of three stages: the input phase, the elaboration phase and the output phase. Throughout each stage, the child is presented familiar toys and assessed on various developmental and cognitive functions. For example, during the input phase, the assessor may explore the child's attention in relation

to the toy. In the elaboration phase, the child's manipulation of the toy is assessed and in the final phase, the child looks at how the child responds, i.e., does impulsive responding reduce in favor of a more reflective response? Through this play-based assessment, the Bunny Bag can provide an estimated developmental age, an account of emerging cognitive functions and provide estimation of the nature and amount of mediation a child needs.

Burns, Delcos, Vye and Sloan (1996) studied children between the ages of 3 years 11 months and 8 years 2 months. The purpose of their research was to examine young children's use of cognitive strategies in dynamic assessment. The task used in these assessment procedures is an adaptation of the Stencil Design Test-1 of the Arthur Point Scale of Performance Test Form 1940 Revision. Each child was given two stencils to recreate a design. The results showed that handicapped children had significant increases in performance after receiving mediation dynamic assessment, but not after graduated prompting or standardized assessment. The mainstream children had significant increases after each treatment, with the most improvement after receiving dynamic assessment mediation.

Another dynamic assessment procedure developed for the preschool population is the Children's Analogical Thinking Modifiability (CATM) instrument. Although it is based on Feuerstein's theoretical model, some modifications were made to adapt the testing to the special needs of this population. For example, the CATM instrument is designed in a game-like fashion to attract and hold the child's attention, as in the analogical problems where the child can manipulate three-dimensional blocks to help

solve the problems. These characteristics as well as the Mediated Learning Experience (MLE) incorporated in the CATM allow the kindergarten child to function on a higher level of thinking and yield a higher level of functioning when compared to the results of static scores (Tzuriel & Klein, 1987).

Lidz and Thomas (1987), developed a dynamic extension of the Kaufman Assessment Battery for Children (K-ABC) for assessing children as young as age 3. They chose to combine the dynamic model with the static approach because there is value to be had from both. Practically speaking, they chose to extend a test that is most likely administered to preschool children between the age of 3 and 5. The study showed that the mediation was effective in producing a higher level of performance than the standardized results.

Validity of Dynamic Assessment:

In order for dynamic assessment to be used world wide, it has to be accepted as a valid test. Researchers such as Guthke, Beckmann and Dobat (1997) have made important contributions to the dynamic approach. Their findings show that the validity coefficients of the learning tests were at least no worse than the validity coefficients of static tests. In longitudinal studies and in studies of low-achieving subjects, dynamic tests usually had higher validity coefficients. In addition, when considering individualized teaching, dynamic tests were superior to static tests at predicting outcomes.

Because of the broad population that can benefit from dynamic assessment, research that tests its validity within different academic domains is needed. Rutland and Campbell (1995) did research using 26 children with learning difficulties. The first goal of the study was to evaluate the extent to which dynamic scores accurately estimated the children's measured intelligence. The second aim looked at the dynamic procedures as useful predictors of the children's improved performance between the pretest and posttest. The results of the study provided evidence to document concurrent and predictive validity, especially among children with learning difficulties.

In Swanson's (1995) study with learning disabled children, the criterion-related and discriminant validity of the Swanson-Cognitive Processing Test (S-CPT) was assessed. First, the study explored whether dynamic assessment was related to academic achievement more so than static tests. Second, the study sought to determine whether children with learning disabilities could be discriminated via dynamic assessment, from slow learners. Results showed that dynamic assessment added important variance in predicting academic achievement. The results supported the idea that a "testing the limits" procedure appeared to tap different cognitive functions that static assessment procedures. In summary, this study supported the criterion-related validity of the dynamic assessment procedures, as well as their discriminant validity in assessing the learning potential of children with learning disabilities who are poor readers.

While there is growing evidence that dynamic assessment is a valid alternative to traditional static approaches, there continues to be a need for further research on the validity of dynamic assessment (Rutland & Campbell, 1995). Haywood, Brown and

Wingenfeld (1990), wrote that establishing the validity of dynamic assessment was difficult because of the unique nature of the procedure. Although some construct validity may be inherent in the dynamic assessment approach, more empirical data are needed to support the validity of this mode. Specifically, the focus should be on those tasks that have an empirically determined relationship to school learning, which in turn should affect predictive validity. Finally, there needs to be more research on validity with subjects for whom traditional measures have been essentially useless, such as young children (Laughon, 1990).

The Application of Cognitive Functions Scale:

In response to the need for dynamic assessment procedures for use with young children, Lidz and Jepsen (2001) developed the Applications of Cognitive Functions Scale (ACFS). The ACFS is a curriculum-based dynamic assessment for use with children between the ages of three through five years old. The six subscales represent learning processes that are needed for success in most American preschool programs. The ACFS yields scores that indicate the degree to which the child has mastered each of the tasks as well as how responsive the child is to intervention. In addition, there are behavior ratings, which describe qualitative aspects of the child's interaction with materials and the assessor. Since the behavior rating descriptors are the same across the six domains, the assessor can compare the child's behavior in relation to the type of task. In this way, the assessor can evaluate the effects of the interaction between the child and the task (Lidz, 2000).

There is some research available on the psychometric properties of the ACFS. The first study was conducted with 30 high functioning pre-kindergarten and kindergarten children attending a private school in New York City. In this case, the preliminary version of the ACFS consisted of five subtests instead of six. This study found significant pretest to posttest gains for three subtests: Classification, Auditory Memory and Visual Memory for children from both grades. As a result of this study, the Verbal Planning and Sequential Pattern Completion tasks needed substantial change. In addition, the Classification task required increased ceiling because of the high functioning level of the children. As a result of this first study, the Planning task was redesigned and divided into Verbal Planning and Perspective Taking, which created the sixth subtest. The Sequential Pattern Completion task was completely redesigned as well (Lidz, 2000).

The next study, conducted by Brooks (1997), used only the Classification subtest of the ACFS and included 22 preschool children with developmental disabilities. This study explored potential practice effects. Therefore, the 11 children in the control group did not receive the intervention portion, but only the pretest and posttest. The results showed that although all of the children were unable to create groups during the pretest, two thirds of the children who received intervention made this transition while none of the children in the control group were able to do so (Lidz, 2000).

Shurin's (1998) study explored the concurrent and discriminant validity of the ACFS. The study involved 26 four-year-old and five-year-old children; all but 5 had been diagnosed with developmental disabilities. The results showed that there was significant

between the pre and posttest scores in the Classification subtests, as well as in the overall ACFS score. However, because there was no control group of non-mediated learners, practice effects had not been ruled out and the gain could not be securely attributed to mediation. Nevertheless, construct validity was supported by the significant gains. The only subtests that did not show significant gains were the two memory subtests. Because these results are dramatically different from the results of the earlier study with high functioning children, (cited above); the difference could have diagnostic implications for differentiating children with and without developmental disabilities. In addition, Shurin's study showed that the behavior rating scale had significant contribution from all but one component.

Levy's (1999) study involved 22 preschool children between the ages of 4-0 and 4-11. Eleven of these children were typically developing preschoolers while eleven of them were special needs preschoolers from mixed ethnic, racial, and socioeconomic backgrounds. The study looked at the ability of the ACFS to discriminate between the two groups of children.

Levy's study produced moderate to strong support for discriminant validity of the ACFS. On the pretest, significant differences between the groups were only found for two subtests. However, on the posttests, differences were significant for four of the subtests. In addition, the typically developing group made significant gains on three of the subtests and on the total score, whereas the special needs group made no significant gains. This study also showed that on Visual Memory and Pattern Completion, typically developing students scored so high during pretest that the possibility of further gains

during mediation was nearly impossible. Therefore there is a need for an increase in the ceiling of these two subtests.

Levy's results indicated that behavior rating during mediation showed the most significant differences between groups. Due to the fact that the ACFS relies heavily on verbal abilities, the typically developing students were more receptive to the teaching offered by the ACFS. Therefore, the ACFS is most appropriate when dealing with children with at least minimal development of verbal abilities and is likely to underestimate the performance of children with language disorders.

Finally, Aranov's (1999) study examines the validity and reliability of the Behavior Observation Rating Scale (BORS), consisting of seven categories of behavior observed and scored during administration of the ACFS. The study investigated how well the researcher's rating of the children during a sample classroom activity correlated with the teachers' rating of the children's general behavior in class. The study also compared the researcher's rating with the speech therapists' rating of the children during a speech therapy session. Also, inter-rater agreement between the scale's author and the researcher was determined by reviewing videotaped samples of preschool children and further evidence regarding reliability was also determined by investigating the consistency of the children's behavior from the situation of speech therapy to that of the general classroom activity.

The results showed that there was highly significant positive correlation between the researcher's behavior ratings of students in the sample classroom activity and the teachers' rating of the children's general behavior. There was also significant positive

correlation between the researcher's rating of the children during a speech session and the speech therapist's rating of the child's general behavior. In addition, there was significant high correlation between ratings of the children by teachers and speech therapists. These results support the consistency of the children's behavior across different situations, as well as the reliability of the scale across varying situations.

The studies reviewed above each looked at various psychometric properties of the ACFS. Each contributes to evidence regarding the reliability and validity of the ACFS scale. This study continues to investigate the validity of the ACFS. In order to show that the intervention is the contributing factor to the higher posttest score, practice effect must be ruled out. Therefore this study explores 4 hypotheses:

1. There will be no significant difference between the E (Experimental) and C (Control) group on either the VM (Visual Memory) or PC (Pattern Completion) Pretest.
2. There will be a significant difference between group E and C on both the VM and PC Posttest in favor of the E group.
3. Within the C group there will be no significant difference between the pre and posttest scores.
4. Within the E group there will be a significant difference between pre and posttest scores.

Method

Participants:

The participants in this study were 30 preschool children between the ages of 3 and 5 years. The population consisted of 16 girls and 14 boys all of whom attended regular education preschool programs in the New York or New Jersey area. More than half the children came from families where at least one parent attained a Masters degree. All of the children except for one had at least one sibling and thirteen of the thirty children came from a family with at least 5 children. The participants' background and socioeconomic class varied across the range of middle to upper class and all were Caucasian and from Jewish backgrounds.

Measures:

The Application of Cognitive Functions Scale (ACFS) (Lidz&Jepsen, 2000) is a dynamic assessment procedure which assesses the child's ability to apply cognitive functions to tasks that represent the learning processes necessary for school achievement. This measure, developed for children ages three to five, consists of six subscales of which 2 were used for this study: (the * indicates which subtests were used for this study)

1. **Classification**- measures the child's ability to group and classify blocks with varying attributes.
2. **Perspective Taking**- measures the child's ability to communicate in a way that reflects understanding of another person's point of view.

3. **Short Term Auditory Memory**- measures the child's short term auditory recall and sequential narrative of a short story.

•4. **Short Term Visual Memory**- measures the child's ability to recall a series of small toys.

5. **Verbal Planning**- measures child's ability to communicate a strategic plan for completion of a familiar activity.

•6. **Sequential Pattern Completion**- measures the child's ability to complete repeated sequential patterns.

Procedure:

The procedure for this study started with contacting mothers of 3 to 5 years old children living in the author's neighborhood in Staten Island. The parents were explained the nature and purpose of the study and times were arranged to meet. The actual testing, done by the author of this study, took on average 45 minutes, spending 20 minutes on each subtest.

The author of this study learned how to administer the ACFS from Dr. Lidz, the scale's first author. First, Dr. Lidz reviewed the manipulatives and the contents of the test. Then she demonstrated how to give the various parts of the test, including the questions and intervention. Finally , after the author of this study administered the test on her own to the children, scoring was done together with Dr. Lidz to ensure correct calculations.

Results

Data Analysis:

The first hypothesis proposes no differences between the Experimental and Control groups on either the Visual Memory or Pattern Completion Pretests. Table 1 shows the results of t tests comparing the means of these groups.

Table 1:

Subtest	Mean(SD)	t	p
PCpre Group E	6.29 (5.28)		
PCpre Group C	5.71 (3.47)	.32	NS
VMpre Group E	4.36 (2.26)		
VMpre Group C	4.79 (2.55)	-.51	NS

The results in Table 1 show that there were no significant differences between E and C groups prior to mediation on either PC or VM. Therefore, these groups can be assumed to have been equivalent prior to intervention.

The second hypothesis question asks if there will be significant differences between groups E and C on both the VM and PC Postest in favor of the E group following the mediation intervention. These results are portrayed in Table 2.

Table 2:

Subtest	Mean(SD)	t	p
PCpost Group E	7.93 (5.26)		

PCpost Group C	6.50 (3.65)	.75	NS
VMpost Group E	5.50 (2.28)		
VMpost Group C	5.21 (2.08)	.33	NS

Table 2 shows that there were no significant differences between the E and C groups following mediation on either PC or VM. This is mitigated by the fact that, while not significant, the E group began at a somewhat higher level than the C group and therefore had further to go to make a significant gain.

The third hypothesis proposes a significant difference between the pre and posttest scores within the C group and within the E group on Pattern Completion. The results are seen in Table 3.

Table 3:

Subtest	Mean(SD)	t	p
PCpre Group E	6.29 (5.28)		
PCpost Group C	7.93 (5.26)	-2.27	.04
PCpre Group E	5.71 (3.47)		
PCpost Group C	6.50 (3.65)	-1.99	NS

Table 3 shows that the E group did make a significant gain following mediation on Pattern Completion, while the C group did not.

The fourth question: Is there A significant difference between the pre and posttest scores within the C group and within the E groups of the Visual Memory subtest?

Table 4:

Subtest	Mean(SD)	t	p
VMpre Group E	4.36 (2.56)		
VMpost Group E	5.50 (2.28)	-1.49	NS
VMpre Group C	4.79 (2.55)		
VMpost Group C	5.21 (2.08)	-.70	NS

The results in Table 4 show that neither the E or C group made significant gains following mediation on Visual Memory. This is explained by the fact that these were typically developed children, and their pretest scores were high, with the posttest scores close to ceiling. That is, there appears to have been a "ceiling effect" on this subtest for these children.

Discussion and Conclusion

This study contributes evidence regarding the validity of the ACFS. Specifically, this study investigated the effect of mediation on the Pattern Sequencing subtest and the Visual Memory subtest of the ACFS.

These results document the lack of "practice affects" for these participants. First, there were virtually no significant gains from pretest to posttest for the groups not experiencing mediation. In addition, the only group demonstrating a significant gain was the mediated group on the Pattern Completion subtest.

Although there were no significant differences between E and C groups prior to mediation on either PC or VM, the E group began at a somewhat higher level than the C group. Therefore, the E group had to further to go to make a significant gain. This may help to explain why there was no significant difference between the E and C groups following mediation on VM.

The lack of significant gains following mediation on the Visual Memory subtest may also relate to the fact that the study used typically developed children. Their pretest scores were high, with the posttest scores close to ceiling. Thus, there appears to have been a "ceiling effect" on this subtest for these children.

Like other dynamic assessment approaches described in the research, the ACFS addresses cognitive functions. The ACFS is unique in addressing cognitive functions of preschool age children. Therefore, the mediation for the Experimental groups consisted of activities such as drawing and manipulation of small toys. In this way, the child's attention is maintained and his/her natural instinct for play is utilized.

Similarly to the Brooks (1997) study, where practice effects were explored on the Classification subtest of the ACFS, this study looks at practice effects on the Visual Memory and Pattern Completion subtests. Whereas Brooks uses children with developmental disabilities in his project, high functioning, mainstream children are tested in this study. However, both sets of results showed posttest gain for those children who received mediation. This is an important contribution because although Shurin's (1999) study showed significant gain between the pre and posttest scores in the Classification and Pattern Completion subtests, practice effect could not be ruled out because there was

no control group of non-mediated learners. Because this study was conducted with high functioning, mainstream children and Shurin's study was done with mostly children with developmental disabilities, an important follow up study would be to rule out practice effect on the necessary subtests, using children with special needs.

This study supports Levy's (1999) results that conclude that there is a need for an increase in the ceiling of the Visual Memory subtest. In both studies, typically developing students scored so high on the pretest that the possibility of further gains after mediation was nearly impossible.

Although the results support the validity of the Visual Memory and Pattern Completion subtests of the ACFS and corroborate with the other research, there are shortcomings to this study. First, the sample was limited in that it consisted of only 30 participants and it was limited to a specific population. All of the children came from similar background and socioeconomic class. In addition, they all attended regular education programs and probably represented the above average range of cognitive ability. Therefore, it is arguable that the results can not be generalized to a larger and more diverse population.

The present study serves as significant research for the school psychologist. Because school psychologists are constantly making important decisions about a child's future education, it is imperative that the tools they use be relevant to the learning process. This is especially true when dealing with the preschool population because decisions being made will impact future learning, and early identification of learning difficulties will give the child the chance to improve his/her learning styles. The ACFS is

the kind of procedure that links assessment with instruction. It not only looks at what the child already knows, but it explores how the child learns, which makes it relevant to the classroom setting. This study contributes to the validity of the ACFS, making it a tool school psychologist can count on for making accurate assessments and as a result, productive and successful educational plans.

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